

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

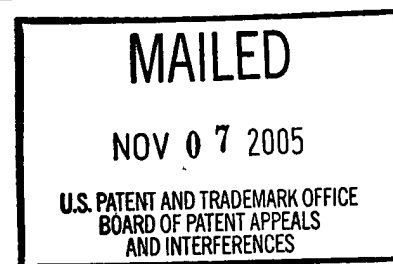
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARKKU LESKELA, MIKKO RITALA, TIMO HATANPAA,
TIMO HANNINEN and MARKO VEHKAMAKI

Appeal No. 2005-1654
Application No. 09/787,062

HEARD: OCTOBER 20, 2005



Before OWENS, JEFFREY T. SMITH, and PAWLIKOWSKI, Administrative Patent Judges.

PAWLIKOWSKI, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 39, which are all of the claims pending in the application. A copy of claim 1 is set forth below:

1. A method for growing oxide thin films on a substrate in a reactor, comprising producing the films by the Atomic Layer Epitaxy (ALE) process by feeding pulses of precursor compounds into the reactor alternately to achieve film growth through saturating surface reactions and by purging the reactor with an inert gas between the precursor pulses to provide alternate self-limiting surface reactions on the substrate, wherein the precursor compounds comprise:

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at least one cyclopentadienyl compound of
strontium and/or barium;

at least one volatile titanium compound; and

a reactive oxygen precursor.

The examiner relies upon the following references as
evidence of unpatentability:

Kirlin et al. (Kirlin)	5,453,494	Sep. 26, 1995
DiMeo, Jr. et al. (DiMeo)	5,972,430	Oct. 26, 1999
Maiti et al. (Maiti)	6,020,024	Feb. 1, 2000

Appellants discuss the following three references¹:

Nakano et al. (Nakano) "Digital chemical vapor deposition of
SiO₂, Appl. Phys. Lett., 57(11), pp. 1096-98 (Sep. 1990).

Bedair, "Atomic layer epitaxy deposition processes," J. Vac.
Sci. Technol., B, 12(1), pp. 179-85 (Am. Vacuum Soc'y, Jan/Feb
1994).

Vehkamäki et al. (Vehkamäki) "Growth of SrTiO₃ and BaTiO₃ Thin
Films by Atomic Layer Deposition," Electrochemical and Solid-
State Letters, 2, pp. 504-06 (1999).

Claims 1 through 39 stand rejected under 35 U.S.C. § 103 as
being obvious over DiMeo in view of Kirlin and Maiti.

¹ Of these 3 references, the examiner only mentions the Bedair article
on page 8 of the answer. On page 9 of the brief, appellants indicate
that the examiner refused to consider the references of Vehkamäki and
Nakano, in the final office action mailed on January 30, 2004. On
page 7 of that final office action, the examiner stated that all 3
references "have not been made of record and therefore have not been
considered". Each of these 3 references were cited in an IDS filed
thereafter, on April 5, 2004. In the advisory mailed on April 15,
2004, the examiner checked the box that the affidavit or exhibit will
not be considered. Hence, we limit our review to only the Bedair
article in this decision in view of the examiner's mention of this
reference on page 8 of the answer.

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On page 3 of the brief, appellants state that claims 1 through 39 stand and fall together. We therefore consider claim 1 in this appeal. See 37 CFR § 41.37(c)(1)(vii) (September 2004).

OPINION

We refer to appellants' position as set forth in the brief and reply brief, and the examiner's position as set forth in the answer, with regard to the issues before us. We provide the following for emphasis only.

The critical issue before us is whether there is a reasonable expectation of success that the types of the precursors disclosed in Kirlin would chemi-sorb in an atomic layer epitaxy process. We note that the prior art can be modified or combined to reject claims as prima facie obvious as long as one of ordinary skill in the art would have had a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 1097, 231 USPQ 375, 379 (Fed. Cir. 1986).

Appellants argue that chemical vapor deposition processes differ from the atomic layer epitaxy processes, but do not address the particular, above-mentioned issue.

The examiner's position is that DiMeo discloses that there are methods for forming multi-component oxide thin film layers, and that these methods include chemical vapor deposition and "related epitaxial deposition methods, such as but not limited to atomic layer epitaxial (ALE) deposition methods." See column 1, lines 25 through 49 of DiMeo. Answer, page 3. In this light, DiMeo further teaches that "[t]he present invention is therefore directed towards the goal of forming multi-component

oxide thin film layers within fabrications such as but not limited to thin film microelectronics fabrications and thin film sensor element fabrications through chemical vapor deposition (CVD) methods and related epitaxial deposition methods, while avoiding the foregoing deficiencies." See column 2, lines 37 through 44 of DiMeo.

Appellants refer to the Bedair reference in support of their position that ALE differs from CVD. Brief, page 6. However, appellants' position in this regard does not negate DiMeo's suggestion that multi-component oxide thin film layers can be formed using CVD and "related epitaxial deposition methods." Id. As stated, supra, the critical issue is whether the type of precursors utilized by Kirlin would reasonably be expected to chemi-sorb in an ALE process.

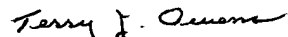
It is the examiner's position that Kirlin's precursors would work in an ALE process. Answer, pages 7-8. At the top of page 12 of the brief, appellants reiterate that ALE and CVD employ different mechanisms and thus have different requirements. Appellants state "[f]or example, precursors used in ALE must be able to provide saturating, self-limiting surface reactions. CVD precursors do not need to have this ability." Hence, appellants do not state that the types of precursors as described in Kirlin cannot work in an ALE process. Therefore, we determine that in view of the suggestion in DiMeo, as discussed, supra, it would have been obvious to one of ordinary skill in the art to use the types of precursors disclosed in Kirlin in an atomic layer epitaxy process for growing oxide thin films.

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In view of the above, we therefore affirm the rejection.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sept. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat., Office 21 (Sept. 7, 2004)).

AFFIRMED



TERRY J. OWENS

Administrative Patent Judge



JEFFREY T. SMITH

Administrative Patent Judge



BEVERLY A. PAWLIKOWSKI

Administrative Patent Judge

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